



## OXYGENATED FUELS ASSOCIATION, INC.

1300 North 17th Street, Suite 1850 • Rosslyn Station • Arlington, VA 22209  
(703) 841-7100 • Fax (703) 841-7720

### **PRELIMINARY ANALYSIS OF THE UNIVERSITY OF CALIFORNIA'S OVERVIEW OF MTBE**

#### **General Summary**

The University of California study (UC study) on the Health and Environmental Assessment of MTBE is contained in five volumes of technical material that have not yet been subjected to peer review or public comment. Thus, any conclusions from the study must be considered preliminary, until such time as the extensive documentation can be carefully reviewed. A more detailed, scientific peer review of the UC study is already underway and the results will be made public shortly. However, a preliminary assessment of the UC study indicates that in general, the study has underestimated the benefits from MTBE-blended Reformulated Gasoline (RFG), and severely overestimated the potential risks to human health and the environment.

The University of California study does not conclude that oxygenates like MTBE provide no measurable air quality benefits as compared to non-oxygenated CalRFG. The study clearly states that this conclusion is true only for "advanced technology vehicles," which the study defines as vehicles four or five years old or newer. But, the California Air Resources Board (CARB) says such vehicles are more properly defined as LEVs (Low Emission Vehicles) and ULEVs (Ultra Low Emission Vehicles), which account for only approximately 5 percent to 5.5 percent of California's vehicle fleet.

Thus, nearly 95 percent of California's total vehicle population is not classifiable as "advanced technology vehicles," and thus does significantly benefit from oxygenated fuels. Also, the study clearly states that for the "newer cars," the only emissions not decreased are exhaust emissions. Exhaust emissions are only part of the auto emission story. Evaporative emissions, which are a significant part of vehicle emissions, do benefit by adding oxygenates to gasoline. Specifically, oxygenates reduce air toxics, such as benzene, as well as the reactivity of evaporative emissions. The bottom line is that oxygenates in gasoline reduce emissions from some 95 percent of California's vehicles.

In fact, even this narrow conclusion, that new cars' exhaust emissions are not reduced, is questioned in the body of the University of California study. Specifically, the study says that the one test relied upon to answer this question did not show that a clear benefit occurred for this small percentage of new cars. The auto/oil study relied upon by the University of California states, "The statistical significance of the oxygenate effects could not be determined because only two fuels were modeled and hence there are no degrees of freedom to estimate an error term." This small auto/oil study did not include a large enough number of fuels or vehicles to determine in an error occurred.

There are, however, numerous other studies, many of which were not fully considered by the University of California literature review, which demonstrate that oxygenates, such as MTBE, provide significant air quality benefits when added to California cleaner burning gasoline. Emission reductions of carbon monoxide, ozone precursors and air toxics from vehicles using oxygenated gasoline are documented in numerous studies by the U.S. EPA, the Auto/Oil consortium, the National Academy of Sciences, the Northeast States for Coordinated Air Use management and the California Air Resources Board.

The UC report's cost-benefits comparisons of MTBE-oxygenated fuels with ethanol fuels and non-oxygenated fuels appear to count certain costs for MTBE and not count these costs for the ethanol and non-oxygenated fuel options, even though these costs would be present in all three cases. For example, remediation and cleanup costs relating to water contamination, for both aquifers and surface water, are included in the calculations attributed to MTBE use. However, the report suggests that there are no such costs associated with ethanol and non-oxygenated fuels. Thus any cost-benefit is invalid without considering these costs. If MTBE is reaching the groundwater, then gasoline leaks and spills are occurring. Gasoline leaks and spills must be monitored and remediated whether MTBE is present or not.

In addition, the cost-benefits calculations in the UC report, which placed non-oxygenated RFG and ethanol RFG as less costly than MTBE RFG, appear to directly contradict the recent California Energy Commission (CEC) study. This study found that for the immediate term the cost of non-oxygenated RFG would be 4.3 to 8.8 cents/per gallon higher than MTBE RFG and that ethanol RFG would be 6.1 to 6.7 cents/per gallon higher than MTBE RFG. Also the CEC report stated that the long term phase out of MTBE RFG would raise gasoline cost 0.9 to 3.7 cents/per gallon for non-oxygenated RFG and 1.9 to 2.5 cents/per gallon for ethanol RFG.

The California Energy Commission report also found that, "Refiners would need to make significant investments to modify their facilities, totaling over \$1.1 billion" (for the non-oxygenates case). Thus, it appears that the UC researchers may not have collected adequate information on refinery economics, daily operational costs, and fuel marketing dynamics that are essential to an objective and comprehensive cost-benefits analysis. The study's calculation appears to inflate the costs associated with MTBE-enhanced fuels and significantly understate the costs associated with ethanol and non-oxygenated fuels.

Finally, there are considerable differences between the "findings and conclusions" as summarized in a simplified, three-page fact sheet, and the actual conclusions and detailed discussions contained in the body of the report and the accompanying specific analyses. As a result of this editorial dichotomy, the casual reader of the summary pages would come away with a far different perspective than might be the case upon a detailed reading of the entire report.

This report is now before a state panel of external reviewers who have approximately six weeks to examine the report before providing a critical assessment of the UC work. We believe this panel, and other reviewers, will concur with the concerns raised in this preliminary assessment of the Report

### Air Quality

There appears to be considerable inconsistency between the air quality impact statements found in the University of California's Executive Summary and Recommendations and fact sheet compared to the body of the report written by the study group.

The body of the report (Vol. III, Sec. 1) states, "While the benefits of reformulated gasoline for automotive emissions has been clearly demonstrated, it is not clear that the presence of MTBE as a component of RFG contributes significantly to the overall air quality benefits."

The Executive Summary and Recommendations translates the above statement "it is not clear" to "there is no significant air quality benefit." The body of the report does not support this statement.

The study group in the body of the report also fails to mention that the above conclusion is based on a single, small exploratory study conducted by the auto/oil consortium in 1995. This emissions study is a statistically weak design for making major policy conclusions since it was conducted on a small group of cars with only one fuel comparison and was also limited to short term emission effects. The strongest conclusion that can be made is that the claim warrants further study.

The University of California Executive Summary and Recommendations makes it clear that the "no significant air quality benefit" applies only to "advanced technology vehicles" and "exhaust emissions." As stated in the General Summary of this paper, this conclusion is only true for a limited percentage of California vehicles. Older cars, sports utility vehicles, and non-commercial trucks and vans, which make up some 80 percent of California's vehicle population, do significantly benefit from oxygenated fuels.

The UC study does not address which gasoline components (and their impact on emissions) from the California refining industry will be used to replace the large volume of MTBE currently used in California gasoline. It would be difficult to explain how air quality can be protected without MTBE because all other gasoline components produced in the California refinery system are generally more atmospherically reactive and also contribute to higher combustion deposits, higher carbon monoxide emissions, higher particulate matter emissions, and higher benzene levels in the evaporative VOC emissions.

It is imperative that policy makers do not rush to judgment until replacements for MTBE can be evaluated to ensure no deterioration of air quality or other unanticipated impacts.

#### **Commentary on Health Effects Assessment, Including Asthma**

The University of California's report was disappointing with respect to its scientific balance on assessing the potential risks to human health from the use of MTBE in reformulated gasoline. The report unfortunately focused on uncertainty in the information, rather than on objective scientific interpretation using the full body of available data, which resulted in the overly conservative conclusions about health impacts. For example, the review on carcinogenicity relied almost entirely on the assessment and methodology used by the state's regulatory agency (Office of Environmental Health Hazard Assessment), and did not consider the independent determination completed by the International Agency for Research on Cancer (IARC), which found that MTBE is not classifiable as a human carcinogen. Additionally, the review correctly points out the known hazards from ethanol exposure, then concludes that adequate margins of safety exist to protect consumers exposed to ethanol blended gasoline. The report fails, however, to incorporate the same approach for margins of safety in considering human exposures to MTBE from its use in cleaner-burning gasoline; safety margins that are also fully adequate to protect consumers from harmful effects.

The report deals with hypothetical suggestions, not supported by any substantive data, that MTBE could somehow contribute to asthma. In reality, ozone, the greatest contributor to environmentally caused asthma attacks, is reduced by cleaner-burning gasoline using MTBE. Finally, the report provides recommendations on areas for further research, which we believe merit careful consideration and, where scientifically valid and appropriate, should be cooperatively supported by government, industry, and other stakeholders.

#### **Commentary on Water Supply Concerns**

The University of California's report attempted to assess the potential impacts and associated costs for water supply contamination due to MTBE use in gasoline. Although the report correctly concludes that the releases of gasoline and MTBE from underground storage tanks (USTs) into groundwater is the greatest area of concern, the report fails to fully consider the real impacts and costs associated with the release of gasoline itself to the groundwater. Natural attenuation strategies used for gasoline-only releases to groundwater have associated costs for long-term monitoring, plume analysis, source clean-up, and source protection, most of which were underestimated in the analysis.

The assessments presented have used mainly worst-case conditions and overly simplified assumptions to reach conclusions, even where available data may indicate otherwise. For example, readily available remediation technologies that are less expensive and equally (or more) effective for many sites were ignored in the analyses. Other real-

world data and site investigation show that the report has significantly overestimated the extent of potential impacts. Available field data show that some 50 percent to 65 percent of MTBE plumes were stable or decreasing in size (the report assumes all were expanding), that 75 percent of MTBE plumes are within 100 feet of BTEX plumes (the report uses only modeling to estimate size), and that active full remediation is necessary for certain conditions (the report assumes at least 90 percent would require full remediation). In addition, the report severely overestimates the volume of contaminated water that might be impacted by gasoline releases containing MTBE, estimating that 100,000 acre feet of water would be impacted by a single plume. Correct calculation show that this number should be less than 200 acre feet per plume, and that if proper source protection and site remediation were undertaken, this number for the purposes of the cost-benefit analysis, should have been reduced to less than 20 acre feet per plume. This would substantially alter the current cost-benefit accounting in the UC Report.

Unfortunately, the report lacks full consideration of current regulatory and engineering practices for source protection and reservoir management strategies, and current UST regulations for upgrading and replacement that reduce the number releases. Finally, according to the California Department of Health Services survey to date, of the 1.4% of total drinking water sources having MTBE detections, only three of them have shut down for treatment and the remaining systems are still being safely used. The UC report improperly assumes that all impacted drinking water resources will require treatment.

#### **Commentary on Economics Costs/Benefits Analysis**

The University of California's report significantly over estimated the economic costs and failed to include all of the benefits associated with MTBE use in RFG. The main text of the report concludes that all RFG formulations reduce carbon monoxide and ozone, including MTBE blended RFG. These air quality benefits, however, do not include health benefits for reductions in other air toxics when MTBE is used. Furthermore, the report does not include air quality benefits for MTBE-blended RFG in cases where other formulations are used that result in increased emissions. For example, increased acetaldehyde from ethanol blending and associated increased health costs are considered; however, decreased acetaldehyde emissions from MTBE-blended RFG relative to non-oxygenated RFG are not considered.

The report has not fully considered the impacts, short-term and near-term, of capital costs to refiners for replacement of MTBE in CalRFG, which the California Energy Commission concluded would be as much as \$1.1 billion. The report assumes steady-state market conditions for alternative products to MTBE, even though significant marketplace disruption and price increases for such alternatives is the more likely scenario.

Finally, the inaccurate projections of impacted water sites needing remediation grossly inflates the cost associated with MTBE use. For example, the cost/benefit analysis quotes a number for UST sites requiring remediation due to MTBE releases that is 1,200 more than stated in other parts of the report.

### **Conclusion**

As noted in this preliminary assessment of the UC study, the study has underestimated the benefits of MTBE-blended RFG and severely overestimated the potential risks to human health and the environment. Any policy decisions regarding management of air quality in California, based on the UC study, should be delayed until the study can be subjected to peer review and public comment.

It should be noted that many of the conclusions of the UC study are based on limited studies that have also not been subjected to careful peer review. By incorporating all the documented benefits of MTBE reformulated gasoline, and based on a more realistic assessment of the potential costs for using MTBE or replacing MTBE, the conclusions of the UC study will be significantly modified, and will likely show that MTBE-blended RFG is a more safe, cost-effective alternative to other options, such as non-oxygenated RFG, that have not yet been fully evaluated.

December 15, 1998